and up to 5 mm long; stigma capitulate, smooth, bilobed; fruit globular, 5–7 mm long, 3–5 mm across, glabrous, dark brown, surmounted by the persistent style or its remnant, the pericarp dry, about 1.5 mm thick; stone (pyrene) woody, nigrescent, terete but somewhat compressed laterally, 4–5 mm long, 2 mm wide (the broader side), shortly constricted at base, crescent at apex (in side view) with erect wood fibers on the anterior-posterior margins; seed whitish, 4 mm long, 1 mm wide, outwardly sulcate with a fine longitudinal median groove; embryo slightly shorter than the seed, with planoconvex cotyledons over 3 mm long.

Type in the Herbarium of the Department of Biology, National Central University, Chungking, China, collected on the exposed bare ground of the steppe, near the ruined city Ch'a-han-chêng, (察汗城), about 30 miles east of Lake Kokonor, Huan-yüan-hsien (湟源縣), formerly known as Tan-kê-erh (丹噶爾), Tsinghai Province, August 10, 1944, by Y. L. Keng and son (no. 5286).

There are two kinds of flowers (see Figs. 3 and 3′) in this species, one near the base of the spike having plumper corollas, subsessile anthers, and short included styles, the other on the upper part with rather slender corollas constricted at the throat, very short but distinct stamen filaments, and longer exserted styles. Though each flower form possesses two well-developed stamens and a pistil, all the fruits seen are found to have a rather long style or its remnant at the apex. Therefore, further examination is needed to decide whether the flower with a short included style is fertile. It is quite certain, however, that the flowers are all entomophilous, since the anthers never exceed the erect corolla-lobes which would be necessary for wind pollination. The zygomorphy of the flower is shown not only by the corolla with three unequal lobes but also by the calyx, which usually has an unequal union of the two laterally placed sepals.

The bract of a rather young flower is dorsally more or less adherent below to the anterior side of the very short cupular receptacle including the calyx tube. But the short calyx tube is sometimes also found to be distinctly exposed in front beyond the adnate portion of the bract. No matter how much the adherence of the bract, the margins are always quite free from either the receptacle or the calyx. If there were no such free margins present, the bract would be easily mistaken in morphology for an anterior lobe of the calyx, which, like the anterior stamen, is entirely suppressed in this species. The corolla is at first distinctly perigynous and very thin in texture but becomes much thicker or even coriaceous at maturity and appears to have increased its size and thickness downward so much that it seems thenceforth to be hypogynous. The deciduousness of the corolla is perhaps caused by the protrusion of the enlarged fruit, which ruptures the corolla and causes it eventually to fall off. Another peculiarity is that the annular disk, which is also perigynous with an attachment a little below the corolla, gives off on both sides two large thick and variously shaped appendages during its development from youth to maturity.

ENTOMOLOGY.—*Synoptic revision of the United States scarab beetles of the subfamily Dynastinae, No. 1: Tribe Cyclocephalini.*[1] LAWRENCE W. SAYLOR, Research Associate, California Academy of Sciences.

The important subfamily Dynastinae has for some time been relatively neglected, taxonomically speaking, and only in the past few years have new species been described or the larval characters of many species better characterized. In all collections I have seen, numerous United States species are grossly misidentified, and it is hoped that the present papers will help to rectify this condition.

Ritcher's paper (1944) is an excellent contribution to the immature stages of these insects. His title, however, *Dynastinae of the United States*, is very misleading, because this paper includes only a small proportion of the described United States species, and only those adults are mentioned of which he had larvae; thus, of the 18 described genera and 119 United States species listed as valid in Arrow's latest catalogue (1937), Ritcher treats the larvae and adults of but 12 genera and 20 species. Even though a

[1] Received August 13, 1945.

number of these 119 names are not valid, many of them are important and well-known species and must be considered. Also, two generic and three specific names that Ritcher uses have been changed; regardless of these taxonomic errors, the paper is very important from an economic standpoint.

Casey's studies in this group have greatly enlarged our synonymy because of his practice of naming trifling variants, but at the same time his Memoirs (1915) gave more detailed information and pointed out more new characters and relationships than had any of his predecessors or contemporaries, including Horn and LeConte; it is indeed too bad that Colonel Casey's idea of a "species" was not exactly that of the vast majority of coleopterists; otherwise his work in this family would have stood for some time. I have had the privilege of studying and dissecting all of Casey's scarab types through the courtesy of Dr. A. Wetmore and Dr. E. A. Chapin, of the U. S. National Museum, to both of whom I am indebted for many favors in the past.

The Dynastinae in most instances possess well-chitinized genitalia, and the characters of those of the male are very helpful in specific determination, and wider use should be made of them. Indeed, in such difficult genera as *Cyclocephala*, it is necessary to dissect and compare the male genitalia in order properly to place many of the troublesome variants.

Dynastine bibliography is now so long and detailed in most genera that very little is to be gained by citing every unimportant reference, as this has already been done in Arrow's catalogue of world Dynastinae. Thus, in the present series of papers, of which this is the first of four, only the important bibliographical references have been selected and a list of those cited is given at the end of each paper. Keys to all tribes and genera will be given in the last paper of the series.

KEY TO THE GENERA

1. Ligula strongly convex, apex very deeply incised and declivous; clypeus long and parabolic, without front angles, and very obtusely angulate at midapex; mandibles very long and slender and exposed beyond clypeal apex; male front claw enlarged.
Ancognatha Erichson

Ligula variable, but never more than slightly emarginate, never incised; clypeus of different shape; claws variable.....2

2. Color black, mandibles broad, rounded externally and either exposed beyond or hidden beneath clypeus; clypeus *either* trapezoidal and short with apex not reflexed *or* clypeus longer and strongly reflexed, with clypeal suture entirely obsolete and front coarsely cribrate and convex.....3

Color testaceous, often mottled with brown cloudings (only *very* rarely blackish); clypeal suture always strongly indicated; mandibles extended beyond clypeal apex and very slender.....4

3. Clypeus very strongly reflexed apically and faintly emarginate; clypeal suture entirely lacking; base of ligula very deeply and triangularly emarginate, apex very narrow; all claws both sexes simple; first segment of hind tarsus longer than next two combined; Arizona.....*Coscinocephalus* Prell

Clypeus faintly emarginate apically and not reflexed; clypeal suture strong; ligula flattened at base, apex very broad; front claws of male enlarged; first segment of hind tarsus a little longer than second.
Dyscinetus Harold

4. Head very broad, nearly three-fourths width of thorax, clypeus very long and flat, sides parallel and apex subrounded; Central America and ?Texas.....*Aspidolea* Bates

Head definitely less than half as wide as thorax; clypeus variable but never exactly as above (if long, no longer than front).
Cyclocephala Latreille

Genus **Ancognatha** Erichson

Ancognatha Erichson, 1847, p. 97; Lacordaire, 1856, p. 398; Bates, 1888, p. 297; Casey, 1915, p. 124.

Only a single species occurs in the United States, but it is quite variable in color, especially the Mexican examples.

Ancognatha manca LeConte

A. manca LeConte, 1866, p. 382; Bates, 1888, p. 335; Arrow, 1911, p. 169; Casey, 1915, p. 127.
A. aequata Bates, 1888, p. 297, pl. 17, fig. 12.
A. perspicua Casey, 1915, p. 126.
A. zuniella Casey, 1915, p. 127.
A. durangoana Casey, 1915, p. 125. (New syn.)
A. laevigata Bates, 1888, p. 297. (New synonymy.)

I have examined specimens from central Mexico to Arizona and New Mexico. Varies in color from deepest black, to black with rufo-castaneous elytra and legs, to castaneopiceous with testaceous legs, scutellum, and thoracic margins; most Arizona specimens are the last phase. The length varies from 15 to 19 mm. The very tumid, deeply cleft ligula will readily place the species.

Genus **Coscinocephalus** Prell

Coscinocephalus Prell, 1936, p. 145.
Anoplocephalus Schaeffer, 1906, p. 259. (Preocc.)

Our single species from Arizona is the sole representative of this genus.

Coscinocephalus cribrifons (Schaeffer)

Anoplocephalus cribrifons Schaeffer, 1906, p. 260; Casey, 1915, p. 124.

The maxilla of this uncommon species is entirely unarmed (no teeth), and the mentum (ligula) is very strongly acuminate apically as in *Cyclocephala hirta*, but differs in the base in *Coscinocephalus* being deeply and triangularly depressed at base. The long and coarsely cribrate clypeus, which is strongly reflexed and faintly emarginate apically, also distinguishes the genus.

Genus **Dyscinetus** Harold

Dyscinetus Harold, 1869, p. 123; Casey, 1915, p. 165; Prell, 1936, p. 147.
Chalepus Macleay, 1819, p. 149; Lacordaire, 1856, p. 403.
Palechus Casey, 1915, p. 174.

Arrow lists 20 species of this purely American genus, which ranges throughout the Americas and the West Indies, and many of them are of considerable economic importance.

KEY TO THE SPECIES

Pygidium entirely and coarsely cribrate; clypeus finely punctured and smooth; eastern United States, west to Texas.... *morator* (Fabricius)
Pygidium coarsely to somewhat coarsely but not densely punctured; spaces between punctures highly polished and smooth; clypeus coarsely and transversely rugose; California and east to New Mexico and south to Mexico and West Indies..... *picipes* (Burmeister)

Dyscinetus morator (Fabricius)

Scarabaeus morator Fabricius, 1799, p. 24; Arrow, 1937, p. 17. (*Dyscinetus.*)
Dyscinetus trachypygus Burmeister, 1847, p. 79; Bates, 1888, p. 312; Casey, 1915, p. 171; Ritcher, 1944, p. 21 (larva).
Dyscinetus discedens Casey, 1915, p. 171.
Dyscinetus borealis Casey, 1915, p. 171.

This is the common rice beetle which ranges through the mid-eastern States and southern States west to Texas and Kansas. The larvae feed beneath the sod and occur also in compost heaps or near pigpens (Phillips and Fox).

Dyscinetus picipes (Burmeister)

Chalepus picipes Burmeister, 1847, p. 79.
Chalepus obsoletus LeConte, 1854, p. 222. (New synonymy.)
Chalepus geminatus Jacquelin du Val, 1856, p. 127.
Dyscinetus ebeninus Casey, 1915, p. 169.
D. subquadratus Casey, 1915, p. 166.
D. gilianus Casey, 1915, p. 168.
D. laevissimus Casey, 1915, p. 167.
D. puncticauda Casey, 1909, p. 282; Casey, 1915, p. 169. (New synonymy.)
D. punctipes Bates, 1888, p. 312.

Specimens have been examined from California, Colorado, Arizona, New Mexico, and Kansas, as well as from Mexico and the West Indies (Puerto Rico, Cuba, Guadeloupe, and Dominican Republic). The pygidial puncturation is highly variable and is usually coarser and sparser in the male, with the female often rather finely and sparsely punctured. In some New Mexican males the pygidium is very cribrately and contiguously punctured at the sides, as is similar in some Mexican males where the pygidium is entirely, coarsely, cribrately, and contiguously punctate over the entire disc; the male genitalia and all other specific characters are identical, thus showing how unreliable the pygidial puncturation (on which many species have been based in the past) really is. The pygidial disc is usually glabrous with long hairs along the apical margin.

Genus **Cyclocephala** Latreille

Cyclocephala Latreille, 1829, p. 552; Lacordaire, 1856, p. 398; Bates, 1888, p. 299; Casey, 1915, p. 112, 134; Arrow, 1937, p. 7 (lists additional subgenera).
Spilosota Casey, 1915, p. 112.
Ochrosidia Casey, 1915, p. 112.
Dichromina Casey, 1915, p. 112.

This truly American genus contains over 200 described species, as well as many undescribed forms. The species are very difficult to separate by means of the older descriptions, and even present-day descriptions must be very long and exceptionally detailed properly to place the species. Many species feed on pollen in the flowers of Arums and become imbedded in the viscous pollen at the bottoms of the spathes; so far as I know, *C. dimidiata* Burmeister is our only species possessing this habit, and it occurs commonly in the flowers of the jimsonweed (*Datura*) in California (Van Dyke and Saylor). One Central American species (*prolongata*

Arrow) has the head and thorax very long and exceptionally narrowed anteriorly, apparently an adaptation for feeding in the blossoms of a narrow flower.

Our American (United States) species have been worked over by Casey in great detail, who described many variants, so that we have 39 names for what I consider to be only 10 valid species. In this study I have examined nearly 3,000 specimens in many collections during the past eight years.

The male tarsi are always enlarged in this genus and the female claws are small and simple. The male genital characters are good, if carefully studied and compared.

KEY TO THE MALES

(Check male genitalia in doubtful specimens)

1. Front tibia *unidentate* (smooth behind apical tooth); dorsally with fine sparse hairs; clypeus parabolic and angles not indicated; Arkansas.....*knobelae* (Brown)
   Front tibia always bidentate or tridentate *or* if apparently unidentate then the head black and clypeus narrow and nearly impunctate apically.....2
2. Front tibia peculiarly *bisinuate* externally (Fig. 1, *n*); head black; clypeus very narrow and rather long, apical half *smooth* and impunctate, apex strongly reflexed and subrounded, angles narrowly rounded; apparently glabrous above; thorax with two large piceous spots before midapex and a small piceous spot each side of disc; Alabama, Mississippi, and Georgia..*setidiosa* LeConte
   Front tibia bidentate or tridentate; other characters not as above.....3
3. Clypeus trapezoidal, apex subrounded and reflexed, angles very broadly rounded; disc *very smooth* and very sparsely and exceedingly finely punctured, to nearly impunctate; thorax and elytra with sparse erect hair, that of pygidium much longer; upper tooth of front tibia obsolete; Georgia, Alabama, Florida.....*puberula* LeConte
   Clypeus variable but always strongly sculptured.....4
4. Large claw front tarsus very strongly and widely cleft and upper tooth nearly as wide as apical one but much shorter in most cases (Fig. 1, *l*); tarsi subequal to or shorter than tibia; head black and elytra testaceous, otherwise rufous; antennal club *ovate*, only as long as segments 3–7 of stem; Mississippi west to California, south to South America. *dimidiata* Burmeister
   Large claw always much more narrowly cleft or claw entire.....5
5. Clypeus very strongly narrowed apically, apex narrowly reflexed; clypeal suture very strongly bisinuate, entire disc very grossly scabrose and entirely punctured; antennal club shorter than stem; fresh specimens with moderate to dense dorsal hairs; ligula strongly narrowed apically and apex pointed (Fig. 1, *w*); California to Texas. *hirta* LeConte
   Clypeus not as above; ligula variable but never actually pointed apically.....6
6. Clypeus fairly long, sides often nearly straight behind and only faintly convergent apically, apex subtruncate and very strongly and highly reflexed; disc very coarsely and transversely, rugosely wrinkled; antennal club large and longer than the stem; California, Lower California, and Arizona. *longula* LeConte
   Clypeus not as above and disc never coarsely and transversely wrinkled.....7
7. Color usually dark castaneopiceous, the thorax lighter; above densely hairy; clypeus long and flat, hardly narrowed at front, apex only faintly reflexed; thorax with a broad, longitudinal impunctate band at middle; scutellum entirely and densely hairy; Louisiana, Arkansas, and Texas.....*robusta* LeConte
   Color usually testaceous or rufocastaneous, often with castaneous cloudings; clypeus definitely narrowed apically; thorax without broad impunctate band.....8
8. Scutellum strongly punctate; pygidium finely and entirely scabrous in basal two-thirds or more (and rarely even to apex), apical area usually densely punctate but polished and smooth between punctures; common California and Arizona, rare New Mexico and Texas.....*pasadenae* (Casey)
   Scutellum punctate or not; pygidium usually not alutaceous or cribrose in more than basal third or fourth; eastern species, rarely west to Texas.....9
9. Pygidium very sparsely and finely punctate the punctures of center disc hard to see, disc usually surface smooth and hairy (frequently hairs nearly entirely worn off); scutellum coarsely and usually densely and setigerously punctate (genitalia Fig. 1, *q* through *u*); Arkansas and eastern United States. *borealis* Arrow
   Pygidium minutely cribrate at least near base the punctures of center disc coarse and obvious; disc denser punctured than *borealis;* scutellum impunctate or very sparsely punctured with apical half usually smooth (genitalia Fig. 1, *y* and *z*); North Carolina and Georgia, west to Kansas and Texas. *immaculata* Oliver

KEY TO THE FEMALES

(Females of *knobelae* and *setidiosa* not included)

1. Hind tarsus much shorter than tibia, or at least definitely shorter; head with the front

coarsely, moderately densely punctured, not rugose; clypeus long and subtruncate, apex reflexed, disc coarsely transversely cribrate; pygidium entirely and cribrately punctate. 2

Hind tarsus subequal to or longer than tibia. . 3

2. Antennal club ovate and short, length of club 2–3 times as long as width through middle of leaves; elytra testaceous and thorax almost always red (very rarely black); western United States and Central America. *dimidiata* Burmeister

Antennal club long and slender, length of club 4–5 times as long as width through middle of leaves; color always testaceous with thorax a little rufous; Arizona, California, Lower California..... *longula* LeConte

3. Clypeus highly polished and smooth, hardly punctate or very finely punctured; front tibia bidentate with an obsolete upper tooth; pygidium very finely and sparsely punctured and polished; Georgia, Alabama, and Florida..... *puberula* LeConte

Clypeus always densely punctured..... 4

4. Body very robust; clypeal disc uneven, suddenly depressed at and on the strongly bisinuate suture, the disc very coarsely and entirely rugosely punctate; clypeus strongly narrowed in apical entirely rugosely punctate; clypeus strongly narrowed in apical half; ligula narrowed to a broad but sharp point; California and Nevada east to Texas. *hirta* LeConte

Body smaller and much less robust; clypeus and head not as above; ligula never exactly pointed at apex..... 5

5. Elytra at middle of lateral margin with a slight to strong, but very discernible, explanate and lobate callus, especially noticeable, when not well developed, in ventral-lateral view, and here the sudden widening of margin is distinct..... 6

Elytra without a lateral callus or enlargement. 7

6. Lateral swelling of elytra usually rather large and quite noticeable; sides and basal corners of pygidium very coarsely cribrate; *mentum usually definitely flat;* eastern States west to Texas..... *immaculata* Oliver

Lateral swelling of elytra usually narrow though obvious if looked for; *mentum* and part of ligula usually rather strongly *convex* or at least noticeably convex; Arkansas and eastern United States..... *borealis* Arrow

7. Color dark castaneous, thorax rufous, usually strongly pilose above, especially the elytra (hairs often abraded); clypeus strongly narrowed from the base; uncommon in Louisiana and Arkansas..... *robusta* LeConte

Color testaceous to rufotestaceous, with castaneous cloudings; glabrous above; clypeus narrowed from about the middle; common in California, Lower California, and Arizona, east to Texas..... *pasadenae* (Casey)

Cyclocephala knobelae (Brown)

Ochrosidia knobelae Brown, p. 23; Sanderson, 1940, p. 380.

I have not seen this species, and the notes are taken from Sanderson. Described from Hope, Ark., and not taken since to my knowledge. The small size (9 mm) and the singly toothed (apical tooth only present) front male tibia should readily separate the species. The genitalia as pictured by Sanderson are allied to those of *hirta*, but the paramere base is narrower here and the sides are evenly rounded near base.

Cyclocephala dimidiata Burmeister

Cyclocephala dimidiata Burmeister, 1847, p. 57; Sanderson, 1940, p. 379; Casey, 1915, p. 161 (*Dichromina*); Saylor, 1937, p. 70 (*Dichromina*).
Ochrosidia ocularis Casey, 1915, p. 162. (New synonymy.)
Cyclocephala elegans Horn, 1871, p. 337; Casey, 1915, p. 162 (*Dichromina*). (New synonymy.)

This common species ranges from Arkansas and through the southwestern United States, to Mexico and Central America and South America. Damages green fruits and leaves of fruit trees; roses and walnuts in California are frequently damaged or defoliated. The grass roots of lawns or golf greens are commonly attacked. Closely related to *longula* in the male genitalia (a little longer parameres there), this species differs mainly in the constant coloration as well as the ovate antennal club, the same being very well developed in *longula*.

Cyclocephala puberula LeConte

Cyclocephala puberula LeConte, 1863, p. 80; Casey, 1915, p. 147 (*Ochrosidia*).

I have seen specimens of this relatively uncommon species from Georgia, Alabama, and Florida. The male genitalia are near those of *hirta*, but externally the species are very different.

Cyclocephala setidiosa LeConte

Cyclocephala setidiosa LeConte, 1856, p. 79; Casey, 1915, p. 158 (*Ochrosidia*).

An uncommon species from Mississippi, Alabama, and Georgia. The male genitalia are exactly the same as *longula*, but externally the species are quite different: in *longula* the mid-apical thoracic margin is definitely but ob-

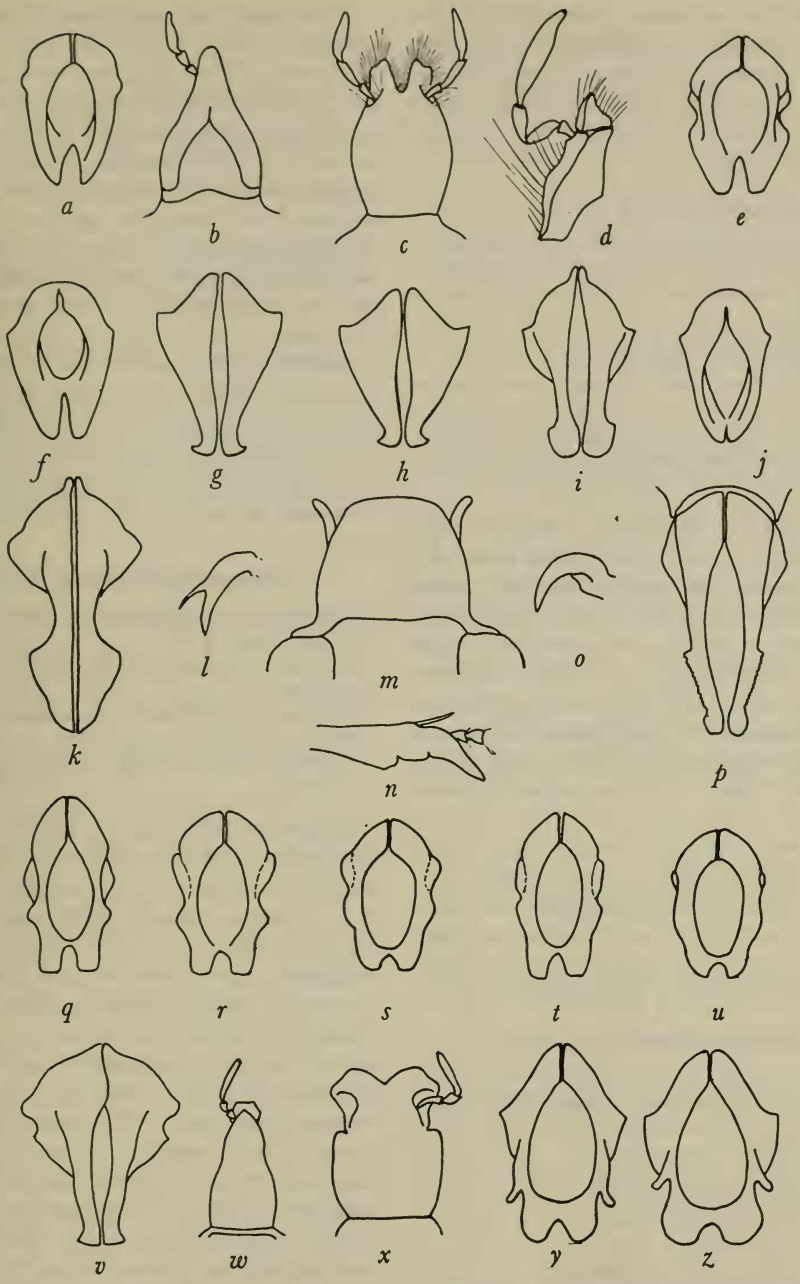

Fig. 1.—*a*, Male genitalia of *Cyclocephala hirta; b*, ligula of *Coscinocephalus cribrifons; c*, ligula of *Ancognatha manca; d*, maxilla of *Coscinocephalus cribrifons; e*, male genitalia of *Cyclocephala pasadenae; f*, male genitalia of *C. robusta; g*, male genitalia of *C. longula; h*, male genitalia of *C. dimidiata; i*,male genitalia of *Ancognatha manca; j*, male genitalia of *Cyclocephala puberula; k*, male genitalia of *Dyscinetus morator; l*, front male claw of *Cyclocephala dimidiata; m*, head and clypeus of male *C. longula; n*, front tibia of male *C. setidiosa; o*, front claw of male *C. longula; p*, male genitalia of *Coscinocephalus cribrifons; q*, male genitalia of *Cyclocephala borealis* (typical form, from Pennsylvania); *r*, same, from Malcolm, Nebr.; *s*, same, from Egypt, Ga.; *t*, same from Egypt, Ga.; *u*, same, from Orlando, Fla.; *v*, male genitalia of *Dyscinetus picipes; w*, male ligula of *Cyclocephala hirta; x*, male lingula of *Ancognatha manca; y*, male genitalia of *Cyclocephala immaculata* (commonest form, from Georgia), *z*, same, from Texas.

tusely prolonged anteriorly, the clypeal disc is coarsely and entirely punctate, and the fore tibia is tridentate; in *setidiosa* the fore thoracic margin is not prolonged, the clypeal disc is impunctate in apical half, and the fore tibia is different (Fig. 1, *n*).

Cyclocephala hirta LeConte

Cyclocephala hirta LeConte, 1861, p. 346; Casey, 1915, p. 132 (*Spilosota*); Saylor, 1937, p. 69.
Spilosota palidissima Casey, 1815, p. 133; Saylor, 1937, p. 69.
S. magister Casey, 1915, p. 132.
S. inconspicua Casey, 1915, p. 133.
S. nubeculina Casey, 1915, p. 131. (New synonymy.)
S. lurida Bland, 1863, p. 354. (New Synonymy.)
Subspecies: *Cyc.* (*Spilosota*) *hirta pilosicollis* Saylor, 1936, p. 2; Saylor, 1937, p. 69.

The mentum is very strongly acuminate and pointed, with the maxilla emerging from the sides of the point. The maxilla have only three minute, hardly discernible teeth. A widely distributed species, and I have seen very large series from California, Utah, Nevada, Arizona Texas, and Lower California. The species is usually testaceous, with castaneous and irregular cloudings on thorax and elytra; most of the Arizona and Texas forms are entirely testaceous.

The subspecies *pilosicollis* Saylor ranges from Sacramento and Davis in central California to Burbank and Pasadena in California. It is distinguished from the typical form by the light testaceous color and the very long hairs over the front, thorax, elytra, and pygidium.

Cyclocephala longula LeConte

Cyclocephala longula LeConte, 1863, p. 79; Casey, 1915, p. 158 (*Ochrosidia*); Saylor, 1937, p. 69.
Cyclocephala californica Arrow, 1937, p. 9 (n. n. for *rustica*). (New synonymy.)
Ochrosidia abrupta Casey, 1915, p. 152; Saylor, 1937, p. 69. (New synonymy.)
O. phasma Casey, 1815, p. 153.
O. obesula Casey, 1915, p. 156.
O. oblongula Casey, 1915, p. 156.
O. rustica Casey, 1915, p. 157 (not Ol. 1789).
O. reflexa Casey, 1915, p. 153.
O. marcida Casey, 1915, p. 155. (New synonymy.)
O. rugulifrons Casey, 1915, p. 154. (New synonymy.)
O. prona Casey, 1915, p. 157. (New synonymy.)
O. ambiens Casey, 1915, p. 155. (New synonymy.)
O. modulata Casey, 1915, p. 154. (New synonymy.)
Cyclocephala abrupta Casey, Ritcher, 1944, p. 17, (larva).

This widely distributed species, known from Oregon, Arizona, Lower California, Utah, and all parts of California is extremely common in the last state during most of the summer nights and is commonly attracted to light. The color varies very little, and the elongate form and sharply reflexed clypeus will readily place the species. I expressed the opinion in 1937 that *abrupta* Casey would probably prove to be the same as the earlier-described *longula* LeConte and the recent study of long series from the Ross and Michelbacher trip to all parts of Lower California has proved the two synonymous. Very close to *dimidiata* in male genital and most other characters but especially different in the much longer antennal club of both sexes, and the forked front claw in the male of *dimidiata* being here at most finely cleft, or entire.

Cyclocephala robusta LeConte

Cyclocephala robusta LeConte, 1863, p. 79; Sanderson, 1940, p. 380.
C. nigricollis Burmeister, 1847, p. 54; Horn, 1871, p. 336.
Ochrosidia nigricollis Burmeister; Buchanan, 1927, p. 167.
O. subvittata Brown, 1930, p. 5; Sanderson, 1940, p. 380.

Sanderson (1940) has pointed out his belief that *robusta* and *nigrocollis* were not the same species, basing his opinion on the examination of the female type of Burmeister's. Horn in 1871 examined the types of both species and considered them identical and Buchanan did likewise in 1927, following Horn. Sanderson separates the two on the shape of the front thoracic angles, length and shape of hind spurs, distance apart of the front tibial teeth, *and* the presence or absence of a dilation at middle of lateral elytral margin; considering these characters, all are *highly variable* in this large genus, with the exception of the last one, namely the swollen margin of the elytra, and so far as I have experienced this varies but little; therefore the two species may be different, but it will be necessary to secure series and males to be really sure. The species is known from Louisiana, Arkansas, and Texas. A single male recently collected on cotton at Lavaca, Tex., is this species, although appearing quite different in color: entirely testaceorufous above with a broad castaneous stripe adjoining the elytral suture, and also coloring the apical eighth of

the elytra, and with a small dark posthumeral umbo spot.

Cyclocephala pasadenae (Casey)

Ochrosidia pasadenae Casey, 1915, p. 148; Saylor, 1937, p. 70 (*Cyclocephala*).
O. arizonica Casey, 1915, p. 149 (New synonymy.)
O. melina Casey, 1915, p. 149. (New synonymy.)
O. pusilla Casey, 1915, p. 150. (New synonymy.)
O. facilis Casey, 1915, p. 150. (New synonymy.)
O. validiceps Casey, 1915, p. 148. (New synonymy.)
O. ovatula Casey, 1915, p. 151. (New synonymy.)

I have examined great series of this common species, which ranges from Lower Calfornia, throughout California, and west through Arizona, New Mexico, and Texas. It is not very variable.

Cyclocephala borealis Arrow

Cyclocephala borealis Arrow, 1937, p. 172 (n. n. for *villosa* Burmeister).
Cyclocephala villosa Burmeister, 1847, p. 54 (non Blanchard, 1846); LeConte, 1863, p. 79; Saylor, 1937, p. 69; Sanderson, 1940, p. 382.
Ochrosidia villosa Burmeister, Casey, 1915, p. 147; Hayes, 1918, p. 135 (biology); Ritcher, 1944, p. 18 (larva).
O. parallela Casey, 1915, p. 144. (New synonymy.)

Distributed from Arkansas and east, rather common along the eastern coast. The pygidium and apical areas of the elytra are usually covered with long and erect hair, but this is very frequently entirely abraded. The male genitalia appear to be more variable in this species than in any other United States species; the Nebraska specimen figured (Fig. 1, *r*) has the male genitalia somewhat similar to those of *immaculata*, but the small lateral toothlike angulation is not sinuate apically at its base, as is the lateral tooth in *immaculata*. The male genitalia of *parallela* specimens from Georgia and Florida look superficially a little different owing to the more rounded lateral process of the parameres, but the slight variations as shown in the two figures of the Georgia specimens (Fig. 1 *s* and *t*), plus the figure of the Florida specimens (Fig. 1, *u*) show how the small notch between the small submedian tooth (or toothlike dilation) and the more basal dilation is filled in, and how the resulting rounder and less-incised genitalia is that of an entirely different-appearing species.

Cyclocephala immaculata Olivier

Cyclocephala immaculata Olivier, 1789, p. 29; Bates, 1888, p. 334; Sanderson, 1940, p. 384; Saylor, 1937, p. 70.
C. frontalis Sturm, 1843, p. 116.
Ochrosidia rufifrons Casey, 1915, p. 145.
O. tenuicutis Casey, 1915, p. 146. (New synonymy.)
O. pagana Casey, 1915, p. 148. (New synonymy.)
O. protenta Casey, 1915, p. 144. (New synonymy.)

A common species in the eastern United States; I have seen specimens from Missouri, Texas, Oklahoma, Kansas, and Arkansas, and from North Carolina, South Carolina, and Georgia in the southeast. Recorded in literature from New Mexico and Guadeloupe, but possibly these may refer to other species. The larvae were described by Forbes in 1894 and Ritcher in 1944. I have seen a male specimen from Thomasville, Ga., that is entirely black above, with the legs and abdomen testaceo-rufous to castaneous; the male genitalia are exactly similar with the typical form. As the figures indicate (Fig. 1, *y* and *z*), the small lateral tooth of the male genitalia varies in position and is more apical in position in the more eastern specimens, but this is an individual variation and all intermediates occur so that it is not of even varietal import.

Aspidolea texana Höhne

Aspidolea texana Höhne, 1912, p. 84.

This is very probably based on a wrongly-labeled specimen from Texas, as I do not believe that the genus occurs here: if it should, the key characters to the genus, plus the extremely broad and very flat ligula and mentum (which is wider at apex than at base) should readily place the species. All other 13 described species of this genus occur in Central America and South America. Male front claws are enlarged and the maxilla is unarmed. *A. texana* was described from San Antonio, Tex., and was a unique female 15 mm long and reddish brown, with the forehead and vertex black.

LITERATURE CITED

ARROW, G. J. Ann. Mag. Nat. Hist. (8) **8**: 169. 1911.
———. Coleopterorum catalogus, pars 156, **21**: 5–18. 1937.
BATES, H. W. Biologia Centrali-Americana,

Coleoptera, 2 (2): 297, pl. 17, fig. 12. 1888.
Blackwelder, R. E. U. S. Nat. Mus. Bull. 185, pt. 2: 250–253. 1944.
Bland, J. H. B. Proc. Ent. Soc. Philadelphia 1: 354. 1963.
Brown, W. J. Can. Ent. 66: 23. 1934.
Buchanan, L. L. Ent. News 38: 167. 1927.
Burmeister, H. Handbuch der Entomologie 5: 54–57, 79. 1847.
Casey, T. L. Can. Ent. 41: 282. 1909.
———. Memoirs on the Coleoptera 6: 109–176, 229–232. 1915.
Erichson, W. F. Arch. für Naturg. 13 (pt. 1): 97. 1847.
Fabricius, J. C. Entomologia systematica, Suppl.: 24. 1798.
Harold, E. von. Coleopterologische Hefte 5: 123. 1869.
Hayes, W. P. Journ. Econ. Ent. 21: 135. 1918.
Höhne, W. Deutsch. Ent. Zeitschr. 1922: 84.
Horn, G. H. Trans. Amer. Ent. Soc. 3: 336–337. 1871.
Jacquelin du Val, P. N. C. Coleoptera. *In* Sagra's Historie . . . de Cuba 7: 127. 1856.
Lacordaire, J. T. Genera des coléoptères 3: 398, 403. 1856.
LeConte, J. L. Proc. Acad. Nat. Sci. Philadelphia 1854: 222.
———. Proc. Acad. Nat. Sci. Philadelphia 1856: 79.
———. Proc. Acad. Nat. Sci. Philadelphia 1861: 346.
———. New species of Coleoptera 1: 79–80. 1863.
Macleay, W. S. Horae entomologicae 1: 149. 1819.
Olivier, G. A. Entomologie 1 (pars 5): 29. 1789.
Prell, H. Ent. Blätter 32: 145–147. 1936.
Ritcher, P. O. Kentucky Exp. Stat. Bull. 147: 17–21. 1944.
Sanderson, M. W. Ann. Ent. Soc. Amer. 33: 379–384. 1940.
Saylor, L. W. Pomona Journ. Ent. and Zool. 38: 2. March 1936.
———. Pomona Journ. Ent. and Zool. 39: 69–70. September 1937.
Schaeffer, C. Trans. Amer. Ent. Soc. 1906: 259–260.
Sturm, J. Deutschlande Fauna: 116. 1843.

ENTOMOLOGY.—Scheloribates chauhani, *a new species of oribatid mite from India (Acarina: Ceratozetidae)*.[1]

Edward W. Baker, United States Department of Agriculture. (Communicated by C. F. W. Muesebeck.)

The discovery that *Zetes emarginatus* (Banks),[2] family Galumnidae, is an intermediate host of the sheep tapeworm, *Moniezia expansa* (Rudolphi), has aroused much interest in the oribatid mites during the past few years. This species, which lives on grass in sheep pastures, was found to be infected with the cysticercoidal stage of the parasite.

B. S. Chauhan, of the Zoological Survey of India, while conducting studies on the sheep tapeworm, has collected oribatid mites from grass. However, these mites belong to the genus *Scheloribates*, family Ceratozetidae, and appear to represent a new species.

Scheloribates chauhani, n. sp.

Female.—Abdomen round-oval; all cephalothoracic bristles barbed, the interlamellar setae inserted nearer to edge of notogaster than to lamellae and longer than others; lamellae tapering distally, not undulate externally, and sides of cephalothorax not or barely visible from above; translamellar lines short; lamellorostral ridge well developed and embracing base of rostral bristle; each pseudostigma with rim usually slightly surpassing edge of pteromorpha, pseudostigmatic organs with head equal to length of pedicel, "oil globules" present, barbs small but distinct. Abdomen with anterior edge of notogaster mildly bowed, its sides merging into pteromorphae; dorsum of abdomen equally arched when viewed from side; pteromorphae with a bristle on anterodorsal area, and with radial combings or fine corrugations on shoulders; dorsal setal pits as figured (body setae apparently knocked off); anal plates wider than long, sides almost parallel, posterior cover bristles closer to inner edge than are anterior bristles, and bristles subequally spaced from anterior and posterior edges; genital plates slightly wider than long, broadly rounded anteriorly, and only slightly concave posteriorly, setae arranged as figured, lateral margins longer than anterior margins. Tarsus I with ventral ciliate setae, dorsal simple setae, and a short rodlike dorsal setae as

[1] Received October 9, 1945.
[2] H. W. Stunkard, Science 86: 312. 1937; W. H. Krull, Proc. Helminth. Soc. Washington 6 (1): 10, 11. 1939.